REMARKS

Claims 1-32 are pending in the present application. Claims 1 and 17 are amended to incorporate subject matter previously presented in claims 4 and 20, respectively. Claims 5 and 21 are amended to properly depend from claims 1 and 17, respectively. Claims 4 and 20 are canceled. Reconsideration of the claims is respectfully requested.

I. 35 U.S.C. § 112, Second Paragraph

The Office Action rejects claims 4-9 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter, which applicants regard as the invention. This rejection is respectfully traversed.

The Office Action states:

> It is not clear from the claim what has to do with the invention (a magnetic tape reader) increasing the stiffness of a free layer of a magnetic disk head spin valve sensor.

Office Action, dated June 3, 2004. Claim 1, which incorporates features previously present in claim 4, is amended to more clearly recite that the sensitivity of the reduced sensitivity spin valve sensor is reduced by increasing an effective anisotropy field of a free layer in the reduced sensitivity spin valve sensor. Claim 5 was amended in the previous response to more clearly recite that the effective anisotropy field of the reduced sensitivity spin valve sensor is increased by increasing a stiffness of a free layer of the reduced sensitivity spin valve sensor. Therefore Applicant respectfully requests withdrawal of the rejection of claims 4-9 under 35 U.S.C. § 112, second paragraph.

II. 35 U.S.C. § 103, Obviousness

The Office Action rejects claims 1, 4-9, 17, 20-25 under 35 U.S.C. § 103 as being unpatentable over *Koren* (U.S. Patent No. 5,424,883) in view of *Tobise et al.* (U.S. Patent No. 5,748,416). This rejection is respectfully traversed.

The Office Action states:

> Regarding claims 1 and 17, Koren discloses an apparatus for reading data, comprising:
>
> a magnetic tape media contact surface configured to contact a magnetic tape media 48; and

> a reduced sensitivity sensor 46 (shielded MR sensor, column 1, lines 51-54), wherein the reduced sensitivity sensor senses an applied magnetic field from the magnetic tape media when the magnetic tape media passes by the reduced sensitivity sensor, and wherein the reduced sensitivity sensor has a sensitivity less than magnetic disk head sensors (column 1, lines 65-68). Koren does not specifically disclose that the sensor is a spin valve sensor.

Office Action, dated June 3, 2004. Applicant respectfully disagrees. The cited portion of *Koren* states:

> Referring to FIG. 1, it is seen that the unshielded MR head response 11 has considerably higher maximum output 10 at long wavelengths than the maximum output 10' of an equivalent shielded MR head.

Koren, col. 1, lines 51-54. Thus, *Koren* does indeed teach a shielded magnetoresistive (MR) sensor. The cited portion of *Koren* also states:

> As current applications of the unshielded MR head are typically for short wavelength use, i.e. 80 kfci and above, and because difficulty was generally experienced in the prior art in equalizing the unshielded MR head over the broad signal frequency range characteristics of the head, the shielded MR head was developed wherein shields were added on either side of the MR element to reduce the sensitivity of the MR head to long wavelength signals.

Koren, col. 1, lines 59-68. Thus, *Koren* teaches differences between shielded and unshielded sensors and how shielding affects the wavelength response of a sensor. However, *Koren* does not teach or suggest a spin valve sensor having a reduced base sensitivity. In fact, *Koren* does not teach *Koren* does not teach a spin valve sensor.

Further with respect to claims 1 and 17, the Office Action states:

> Tobise discloses that the sensitivity is reduced from a sensitivity of the magnetic disk head spin valve sensor by increasing an effective anisotropy field of a free layer in a magnetic disk head spin valve sensor (see figure 3 where the sensitivity of the invention is reduced by increasing the effective anisotropy field of the free layer using a different composition of the permanent magnet).

Office Action, dated June 3, 2004. Applicant respectfully disagrees. *Tobise* does teach the use of permanent magnets and that a particular composition of the permanent magnets

in a SAL-type MR head may result in elimination of Barkhausen noise without a significant decrease in output. More particularly, with reference to FIG. 3, *Tobise* states:

> Referring to FIG. 3 and FIG. 4, there is shown the changes in output from the SAL-type MR head and the Barkhausen noise elimination ratio for different playback track widths. In this comparative example for a permanent magnet membrane, the composition is Co:74, Cr:18, Pt:8 (atom %), with a B_r of approximately 6000 G for the residual flux density. For the present invention, an alloy of Co:76, Cr:12, Pt:12 (atom %) with a B_r of approximately 11000 G is used.

Tobise, col. 12, lines 23-30.

> With either composition, the output diminishes as the track width is narrowed. This is due to the fact that as the permanent magnet membranes approach each other, the magnetic field applied to the MR membrane becomes stronger and sensitivity decreases. With the thickness of the permanent magnet membrane made the same as in this embodiment, the present invention was compared to the prior art example. It was possible that a problem would arise if the sensitivity would decrease because the use of the alloy of the present invention would provide a larger $B_r$xt than the prior art example. However, even when the playback track width was narrowed to 0.1 micron, an adequate output was obtained, so this was not a problem.

Tobise, col. 12, lines 50-62. However, nowhere does *Tobise* teach reducing the sensitivity of a spin valve sensor by increasing the effective anisotropy field of the free layer. In fact, the cited portion of *Tobise* describes a SAL-type MR head, not a spin valve type MR head.

Tobise does teach an embodiment with a spin valve type MR head in col. 13, line 50, to col. 14, line 35. However, *Tobise* makes no mention whatsoever of reducing the sensitivity of the spin valve sensor **by increasing the effective anisotropic field of the free layer**, as recited in claim 1, as amended. The applied references, when considered as a whole, fail to teach or suggest each and every claim limitation. Therefore, the proposed combination of *Koren* and *Tobise* does not render the claimed invention obvious.

Even assuming, *arguendo*, that a person of ordinary skill in the art would have found it obvious to combine *Koren* and *Tobise*, the combination would not result in the presently claimed invention. Rather, if the permanent magnet compositions of *Tobise* were applied to the MR head of *Koren*, the result would be a MR head with elimination of Barkhausen noise and no significant reduction in output. However, the combination would not result in a spin valve sensor with reduced sensitivity by increasing the effective anisotropic field of the free layer, as in the presently claimed invention.

Furthermore, *Tobise* teaches away from the claimed invention. *Tobise* states:

> The narrowing of the playback track widths makes the longitudinal length of the MR film shorter, so that permanent magnetic films 21 disposed separately on either side are separated by a smaller interval of space. Consequently, a strong magnetic field is applied to the MR film. This means that using a permanent magnet film having the same residual flux density and film thickness product (B_r•t) as is used for conventional wide playback tracks will have difficulty causing the rotation of the magnetization for the MR film. Further, while Barkhausen noise will be limited, the sensitivity will decrease. Thus, it is necessary to minimize the (B_r•t) product within a range where Barkhausen noise can be limited **without decreasing sensitivity**.
>
> Two possible ways to decrease the (B_r•t) product are to lower residual flux density B_r or to make film thickness t smaller. However, with a CoCrPt film, which has a low B_r, decreasing the thickness of the film severely decreases coercive force H_c. What is needed is a permanent magnet film that is thin yet able to apply a bias field of an appropriately high magnitude solely to the MR film. The permanent magnet film must also have a high coercive force. This would result in an MR head structure that provides a narrow gap and allows narrow playback tracks. Barkhausen noise would be limited **while output would not be decreased.** Specifically, what is needed is a permanent magnet alloy composition that provides a thin film while also providing a (B_r•t) product capable of applying an adequate magnetic field and a sufficient coercive force H_c. [emphasis added]

Tobise, col. 5, lines 11-38. Thus, *Tobise* teaches that it is undesirable to reduce the sensitivity of any MR head. For this reason, a person of ordinary skill in the art would

not have found it obvious to apply the teachings of *Tobise* to *Koren* for the purpose of reducing the sensitivity of the MR head in *Koren*. The only apparent reason for making such a combination would be to reconstruct the claimed invention using the present specification as a template or instruction manual.

Independent claim 17 recites subject matter addressed above with respect to claim 1 and is allowable for the same reasons. Since claims 5-9 and 21-25 depend from claims 1 and 17, the same distinctions between *Koren* and *Tobise* and the invention recited in claims 1 and 17 apply for these claims. Additionally, claims 5-9 and 21-25 recite other additional combinations of features not suggested by the reference.

Therefore, Applicant respectfully requests withdrawal of the rejection of claims 1, 4-9, 17, 20-25 under 35 U.S.C. § 103.

III. Conclusion

It is respectfully urged that the subject application is patentable over the prior art of record and is now in condition for allowance.

The Examiner is invited to call the undersigned at the below-listed telephone number if in the opinion of the Examiner such a telephone conference would expedite or aid the prosecution and examination of this application.

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Respectfully submitted,

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